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The United States, Climate Change, and the Arctic Maritime Commons

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14. ABSTRACT

Driven by climate change in the Arctic a new maritime commons is emerging. The summer of 2007 brought the opening of the fabled Northwest Passage through the Canadian Arctic Islands and accessibility to non-ice hardened ships. Within the next 20 years, the entire Arctic will likely be entirely ice free during the summer, opening new ocean transport routes and access to potentially 25 percent of the world's remaining undiscovered oil and natural gas reserves. These changes will reshape both the global transport system and the world energy market, raising the specter of tension and conflict in the Arctic.

With the Arctic region opening, nations are rushing to lay claim to its maritime energy resources. The Arctic nations of Canada, Denmark, Norway, and Russia seek to extend their claims beyond the traditional 200 nautical mile limit; however the United States is left out in the cold. The United States is the sole Arctic nation not to have signed the United Nations Convention on the Law of the Sea (UNCLOS).

The contest for resources and flow of trade will require that the United States, in conjunction with its allies, act to ensure access and security in the Arctic region. The present arrangement of three combatant commanders having responsibility in the Arctic will not promote efficient operations in the region in response to a re-emerging Russia.

To maintain its leadership position, the United States must adapt to changes in the Arctic and the political contest it brings. It must participate in pivotal international treaties and ratify UNCLOS. To facilitate responsive operations in the Arctic, the United States must create a unique inter-agency command and control structure that will provide presence, serve as a credible deterrent against Russia and ensure the uninterrupted flow of goods and oil.

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NAVAL WAR COLLEGE
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Adapting to a Changing World:
The United States, Climate Change, and the Arctic Maritime Commons

By

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

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Signature:

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5 November 2007

Abstract

Adapting to a Changing World:
The United States, Climate Change, and the Arctic Maritime Commons

Driven by climate change in the Arctic a new maritime commons is emerging. The summer of 2007 brought the opening of the fabled Northwest Passage through the Canadian Arctic Islands and accessibility to non-ice hardened ships. Within the next 20 years, the entire Arctic will likely be entirely ice free during the summer, opening new ocean transport routes and access to potentially 25 percent of the world's remaining undiscovered oil and natural gas reserves. These changes will reshape both the global transport system and the world energy market, raising the specter of tension and conflict in the Arctic.

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To maintain its leadership position, the United States must adapt to changes in the Arctic and the political contest it brings. It must participate in pivotal international treaties and ratify UNCLOS. To facilitate responsive operations in the Arctic, the United States must create a unique inter-agency command and control structure that will provide presence, serve as a credible deterrent against Russia and ensure the uninterrupted flow of goods and oil.

> Climate change is gradually opening up the waters of the Arctic, not only to new resource development, but also to new shipping routes that may reshape the global transport system. While these developments offer opportunities for growth, they are potential sources of competition and conflict for access and natural resources.
>
> *A Cooperative Strategy for 21st Century Seapower*

A new Arctic maritime commons is opening as a tangible reality of climate change. In the next two decades, portions of the Arctic will be largely ice free for many months of the summer. With the retreat of the Arctic ice, new direct shipping routes between the Atlantic and Pacific will open. Additionally, this will bring access to a wealth of untapped natural resources; including 25 percent of the world's remaining undiscovered reserves of oil and natural gas.[1]

Changes in the Arctic have already brought a growing surge of maritime claims and commercial activity. The United States must answer two questions in determining how it will adapt in a changing Arctic. First, what strategic interests does the United States have in the region and what role will the country take in an ice-free Arctic? Second, what is the nature of the command and control organization required for the United States to operate in this emerging maritime commons?

The Arctic Ocean is a region of vital national interest to the United States. With its rich natural resources, commercial shipping interests and conflicting maritime claims it represents a new maritime domain that is also a potential hot bed of dispute and conflict. For the United States to exert a leadership position in the Arctic, it must participate in international treaties that provide mechanisms for resolving conflicts over maritime claims. Furthermore, the demands of the Arctic require a unique command and control structure

[1] U.S. Arctic Research Commission, *Report on Goals and Objectives for Arctic Research 2007 for the U.S. Arctic Research Plan*, (Arlington, VA: U.S. Arctic Research Commission, 2007), 1.

capable of dealing with the remote, hostile environment and multi-national character of the region.

Global Climate Change – A Brief Summary

Global climate change is causing temperatures in the Arctic to rise and, as a result, the retreat of the Arctic sea ice. The rate at which the ice is retreating exceeds computer models. Until this year, scientists' estimated the loss of sea ice at 2.5 percent per decade between 1953 and 2006. These models, used by the Intergovernmental Panel on Climate Change (IPCC) a United Nations organization, in their 2007 assessment, pointed to the fabled Northwest Passage through the Canadian Arctic islands opening to non-ice hardened ships during portions of the summer within the next 30 years. The models also predict that

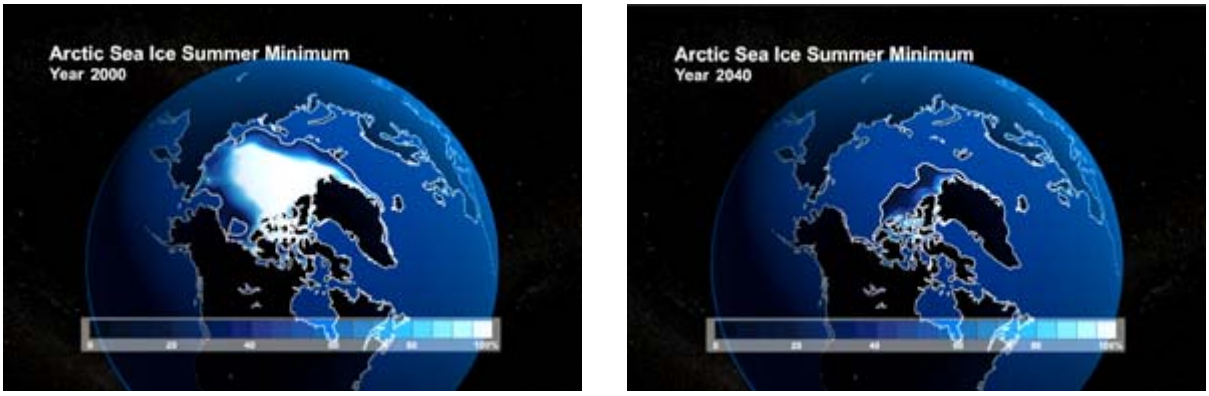

Figure 1 - Illustration Courtesy of UCAR

the Arctic basin would become largely ice free during the later half of the century. Recent data, compiled by the National Center for Atmospheric Research (NCAR) and the University of Colorado's National Snow and Ice Data Center (NSIDC), reveals that the actual rate of decline is three times faster than predicted. Sea ice in the Arctic declined at an average rate of 7.8 percent per decade between 1953 and 2006, paralleling the rise in temperature during recent decades. However, Arctic sea ice has declined at an accelerated rate of 9.1 percent per

decade since 1979.[2] In September 2007, arctic sea ice coverage reached an all time low, with ice coverage 23 percent less than the previous record set just two years ago.[3] What is more, 2007 marks the first time, since satellite records began in 1979 that the Northwest Passage is actually ice free, 30 years ahead of predictions published only earlier this year. This has led leading scientists to predict that the Arctic basin may well be ice free in the summer as soon as 2030 (see Figure 1).[4] (See Appendix for additional discussion on climate change and the Arctic)

An Ice Free Arctic – Why Does it Matter?

What is the relevance of the changes taking place in the Arctic to the world and specifically to the United States? There are many compelling reasons for concern, including rising sea levels, impact on wildlife, fisheries and ecosystems, and the dire ramifications on global climate change as a whole. While very real, most are beyond the scope of this paper and not as compelling to the interests of industrialized nations as the emerging access to new energy resources that the decline in the Arctic sea ice brings. Like the gold rush that followed the discovery of gold at Sutter's Mill in 1849, the opening of the Arctic is resulting in a new gold rush, on an international scale, to secure access to the oil the region might contain.

[2] The University Corporation for Atmospheric Research, "Arctic Ice Retreating More Quickly than Computer Models Project," 30 April 2007, http://www.ucar.edu/news/releases/2007/seaice.shtml (accessed 14 October 2007).
[3] National Snow and Ice Data Center, "Arctic Sea Ice Shatters All Previous Record Lows," 1 October 2007, http://nsidc.org/news/press/2007_seaiceminimum/20071001_pressrelease.html (accessed 14 October 2007).
[4] National Snow and Ice Data Center, "Arctic Sea Ice Shatters All Previous Record Lows," 1 October 2007. Ibid., Illustration.

The Middle East contains approximately 60 percent of the world's oil reserves of which Saudi Arabia alone possesses 25 percent.[5] All of this oil is in the possession of countries whose economies are dependent on the flow of oil, and whose social and political structures are frequently rocked by corruption, insurrection and extremism. The United States and other developed nations have been engaged in the region for decades in an effort to ensure a stable supply of oil. Several military interventions including the "Tanker War" in the late 1980s, Desert Storm in 1991 and the current conflict in Iraq have arguably fallen out of this effort. Finally, relations between the United States and Iran show no sign of improving anytime soon. Ensuring a stable supply of energy resources from the Middle East will remain a source of great concern for the United States and other industrialized nations as long as the Middle East continues to hold such a dominant position in the world's energy market.

The Arctic is thought to contain large reserves of oil, natural gas and other natural resources. Specifically, the United States Geological Service as part of its World Petroleum Assessment 2000 estimated that the Arctic contains more than 20 percent of the remaining undiscovered oil reserves and 27 percent of the remaining undiscovered natural gas reserves.[6] The Arctic is boarded by five developed nations, the United States, Canada, Denmark, Norway and Russia. Although there is disagreement as to the true extent of the United States Geological Service findings, the prospect of developing energy resources in the possession of technologically advanced nations, with diverse economies and stable governments could shift

[5] Energy Information Administration, *International Energy Outlook 2007*, DOE/EIA-0484(2007), (Washington, D.C.: Office of Integrated Analysis and Forecasting, U.S. Department of Energy, May 2007), 36-38, http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2007).pdf (accessed 14 October 2007).
[6] Thomas Ahlbrant, "Future Oil and Gas Reserves of the World – Unresolved Issues," Powerpoint, U.S. Department of the Interior, U.S. Geological Service, http://www.netl.doe.gov/energy-analyses/pubs/Ahlbrandt_NREL_Talk.pdf (accessed 19 October 2007).

the focus of the world energy trade away from the volatile Middle East to the Arctic.[7] Indeed, in Siberia alone, the oil and natural gas reserves rival those of some Middle East countries, of which only a fraction has been exploited. Access to much of these regions is best done from ports along Siberia's north coast, utilizing the Northern Sea Route.[8]

The Northwest Passage, the short cut between the Atlantic and Pacific Oceans has tantalized explorers for centuries. From John Cabot in 1497 to Vitus Bering and Captain James Cook in the 1700s to the disastrous Franklin expedition of 1845 (they all died), the Northwest Passage remained elusive. The Northwest Passage was not successfully navigated until 1909, when Roald Amundsen completed a three year expedition through the passage. Now with the retreat of the Arctic sea ice, the Northwest Passage represents just one of two main sea routes that are, or will soon become, open for commercial shipping during increasingly greater portions of the year.[9] While the Arctic will remain a harsh, unforgiving environment, the retreat of the sea ice will allow non-ice hardened ships, especially tankers, to cut 5,000 to 7,000 miles off their trip from Europe to Asia and save 10 to 15 days in transit when compared to going through the Panama or Suez Canals (see figure 2).[10] Already, a growing fleet of internationally built specialized tankers, whose hulls are strengthened to work in limited ice, are transiting the Northern Sea Route, transshipping Siberian oil and

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[7] Wood Mackenzie Research and Consulting, "Arctic Role Diminished in World Oil Supply," 1 November 2006, http://www.woodmacresearch.com/cgi-bin/corp/portal/corp/corpPressDetail.jsp?oid=751298 (accessed 19 October 2007).

[8] Jessie C. Carman, "Economic and Strategic Implications of Ice-Free Arctic Seas," in *Globalization and Maritime Power*, ed. Sam J. Tangredi et. al. (Honolulu, HI: University Press of the Pacific, 2004), 174-176.

[9] The Northwest Passage and the Northern Sea Route are the two major routes in the Arctic. The Northwest Passage runs from the Pacific through the Bering Strait, along the northern coast of Alaska and Canada through the Canadian Arctic Islands into Baffin Bay and enters the Atlantic via the Davis Strait between Greenland and Canada. The Northern Sea Route, an active route during Soviet times and maintained so by the extensive use of ice breakers, runs from the Pacific through the Bering Strait along the north coast of Russian Siberia, into the Barents Sea, north of European Russia and around the coast of Norway into the Atlantic.

[10] Clifford Krauss, Steven Lee Myers, Andrew C. Revkin and Simon Romero, "As Polar Ice Turns to Water, Dreams of Treasure Abound," *The New York Times*, 10 October 2005, http://www.nytimes.com/2005/10/10/science/10arctic.html?_r=1&oref=slogin (accessed 19 October 2007).

Ibid., Map.

minerals as well as Norwegian natural gas.[11] As a result, between today and 2030, by which time the Arctic basin will almost certainly be ice free for a large portion of the year, the Arctic will become a bustling international commerce route between east and west.

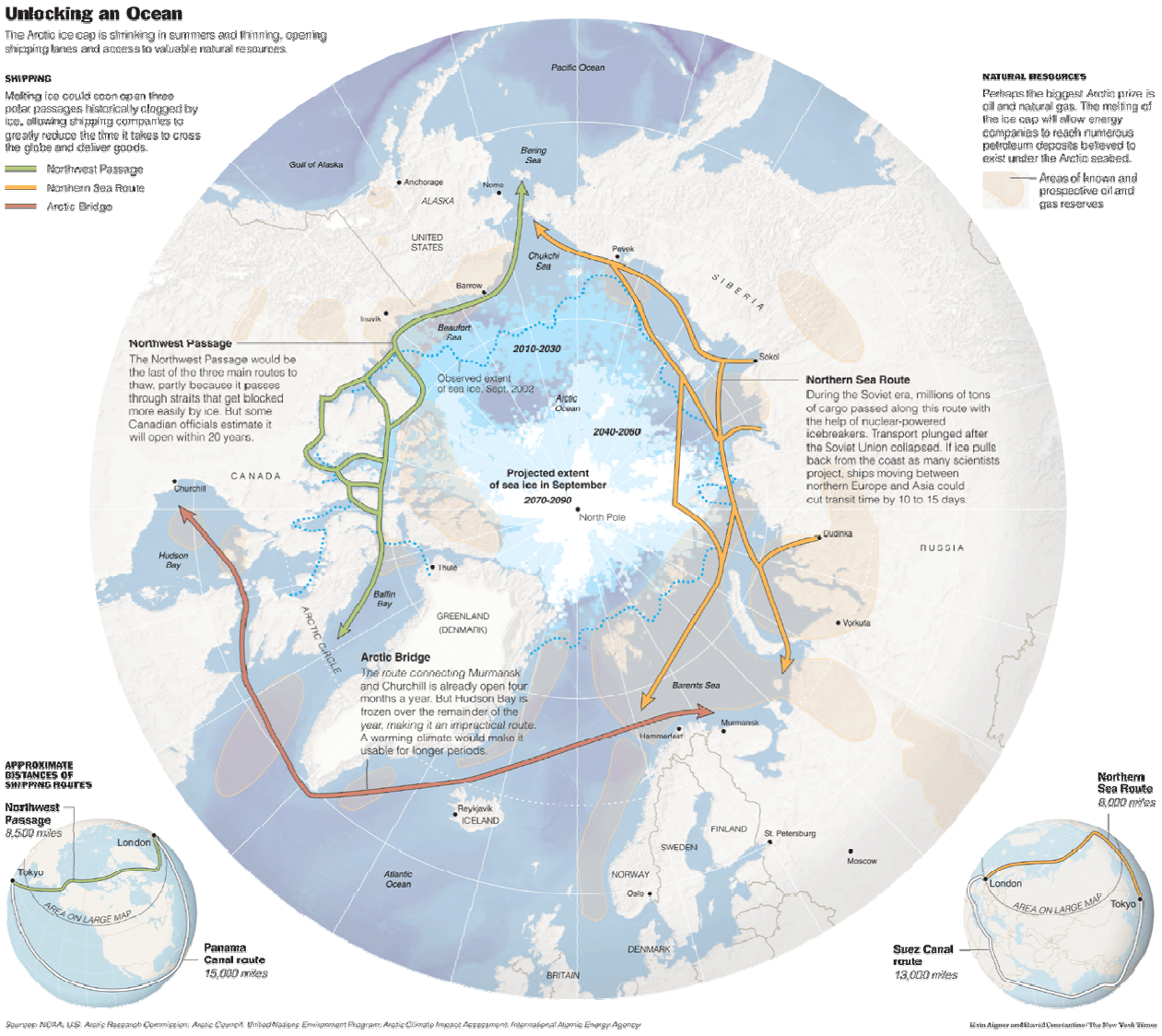

Figure 2 – Reprinted from NYTimes.com

Global climate change and the retreat of the Arctic sea ice, is opening new frontiers for extracting energy resources and commercial shipping routes. This represents nothing less than the opening of a new maritime commons in the Arctic. For the United States, promoting security, diversifying energy markets, deterring aggression by potential peer competitors,

[11] Jessie C. Carman, "Economic and Strategic Implications of Ice-Free Arctic Seas," 175.

strengthening alliances and ensuring global access to the Arctic maritime commons are nested objectives of the United States National Security Strategy, National Defense Strategy and National Military Strategy.[12] What is more, as the recently unveiled United States Maritime Strategy points out, "90 percent of world trade and two-thirds of its petroleum are transported by sea. The sea-lanes …. are the lifelines of the modern global economy," thus making the Arctic maritime commons, a burgeoning maritime superhighway, a region of vital interest to the United States.[13]

U.S. Strategic and Operational Considerations it the Arctic - Bounding the Problem

Even in the 21st century, the Arctic remains a remote region of the world and a difficult one in which to operate. The United States must understand the factors at work in the region, how these factors will affect strategy and policy and in turn, how operational considerations in the Arctic will be affected. Now is the time to review and formulate anew the United States Arctic policy, reflecting current and future geopolitical interests in the region.

United States strategy and policy in the Arctic date back to 1983, when National Security Decision Directive (NSDD) 90 was signed. In a one page section, entitled "United States Arctic Policy," it established the United States' interest in the Arctic as related to national defense, energy research and development, scientific endeavors and environmental

[12] U.S. President, *The National Security Strategy of the United States of America*, (Washington, D.C.: The White House, March 2006).
Secretary of Defense, *The National Defense Strategy of the United States of America*, (Washington, D.C.: The Pentagon, March 2005).
Chairman, U.S. Joint Chiefs of Staff, *The National Military Strategy of the United States of America* (Washington, D.C.: CJCS, 2004).
[13] Chief of Naval Operations, Commandant of the U.S. Marine Corps, and Commandant of the Coast Guard, *A Cooperative Strategy for 21st Century Seapower*, (Washington, D.C.: Department of the Navy, October 2007), 5, http://www.navy.mil/maritime/MaritimeStrategy.pdf (accessed 20 October 2007).

protection.[14] At that time, when the Arctic sea ice was still viewed as a permanent fixture, the United States' adversary was the Soviet Union and territorial claims in the Arctic were of little real consequence and the only ships to regularly transverse the Arctic were submarines.

Now, twenty-four years latter, the retreat of the Arctic sea ice has brought new importance to maritime claims of territorial waters and exclusive economic zones. Nations bordering the Arctic are seeking to establish broad claims over the Arctic basin to ensure exclusive rights to the resources contained within the claimed territory. Conflicting national interests are at odds even among traditional allies such as the United States, Canada, Norway, and Denmark, and especially between former rivals, Russia and the United States.

The legal basis for the maritime claims in the Arctic is the United Nations Convention on the Law of the Sea (UNCLOS) which was signed on 10 December 1982. UNCLOS consolidates and updates hundreds of years of customary laws and treaties regarding the law of the sea into one legally binding document. Under Article 76 of the treaty, a coastal state can claim its continental shelf out to 200 nautical miles beyond its territorial sea for its exclusive economic use. Additionally, UNCLOS provides for coastal states to extend their continental shelf claim beyond 200 nautical miles provided they can demonstrate a geographic connection back to its continental shelf as defined by the 200 nautical mile limit, such as a submarine ridge.[15] This provision can allow a country to

Figure 3 - Reprinted from the BBC

[14] U.S. President, *United States Arctic Policy*, National Security Decision Directive 90, (14 April 1983), http://www.fas.org/irp/offdocs/nsdd/23-2075t.gif (accessed 28 September 2007).

extend its claim out hundreds of miles and add thousands of square miles of seabed over which it has an exclusive claim. In the geographically constrained Arctic, where five nations border the region and all points lead to the North Pole, this is a source of potential conflict as claims overlap (see figure 3).[16] As recently as August of this year, a Russian submersible, part of an expedition conducting surveys of the Arctic, planted their flag on the Arctic seafloor at the North Pole (see figure 4).[17] The Russians are claiming that a submarine ridge, the Lomonosov Ridge, which runs across the North Pole, is an extension of the Russian continental shelf. By doing so, they claimed nearly half of the Arctic outside 200 nautical miles from land, extending all the way to the North Pole.[18] Not to be out done, Denmark also asserts the Lomonosov Ridge is an extension of Greenland as the basis to extend their continental shelf claim, which places the Danes in competition with Russian, Canadian, and Norwegian claims.[19]

Reprinted from the Telegraph.co.uk

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[15] "United Nations Convention on the Law of the Sea," 10 December 1982, Article 76, http://www.un.org:80/Depts/los/convention_agreements/texts/unclos/closindx.htm (accessed 20 October 2007).

[16] Clifford Krauss, Steven Lee Myers, Andrew C. Revkin and Simon Romero, "As Polar Ice Turns to Water, Dreams of Treasure Abound," *The New York Times.*

Anthony Klaus Arend, "Russia May Advance Claim to Continental Shelf in the Arctic," Georgetown University, 29 June 2007, map.

[17] Matthew Moore, "Russian Arctic Stunt Celebrated by Moscow Press," *Telegraph.co.uk*, 4 August 2007, picture, http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2007/08/03/wpole203.xml (accessed 25 September 2007).

[18] "Tests Prove Lomonosov Ridge Is Part Of Russian Continental Shelf – Ministry," *ITAR-TASS*, 20 September 2007, http://www.opensource.gov (accessed 25 September 2007).

[19] Andrew C. Revkin, "Jockeying for Pole Position," *The New York Times*, 10 October 2004, http://proquest.umi.com (accessed 28 September 2007).

As part of the provisions of Article 76 of UNCLOS, continental shelf claims beyond the standard 200 nautical miles require an extensive data package including mapping and sediment samples. This package must be submitted to the Commission on Continental Shelf Limits, established by the UNCLOS, for decision before any such claim becomes legally binding. Starting in 1999, countries have 10 years from the date they ratify the

Another territorial waters dispute in the Arctic that affects United States decision making and operations, is Canada's claim concerning the Canadian Arctic Islands. In September 1985, the Canadians claimed a "straight baseline" around these islands, asserting that all the waters surrounding these islands were considered "internal waters" of Canada. This claim would limit the ability of foreign flagged vessels, particularly warships and aircraft, to transit the passage, except as allowed by "innocent passage."[20] At the time the Canadian claim was made, the United States protested, asserting that the Canadians had no legal basis for their claim and that their action was an infringement on the right of freedom of navigation. The United States considers "the passage a strait used for international navigation subject to the transit passage regime."[21]

When the Canadians made their claim in the 1980s, their principle concern was the submerged transit of submarines through the Arctic Islands, particularly American submarines. Submerged operations are legal under transit passage through an international strait, but under innocent passage, a submarine must operate on the surface and fly its national colors. With the retreating ice, the looming opening of the Northwest Passage and the view that the United States and Russia are the 'bad guys,' Canada is even more determined to assert its sovereignty claim in the Arctic. To enforce this claim, Canada has

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treaty to submit their claims, thus the first claim submissions are due by 2009 for countries such as Russia that ratified the treaty prior to 1999.
"United Nations Convention on the Law of the Sea," 10 December 1982, Appendix II.

[20] Straight Baseline – A legal construct of UNCLOS that allows a coastal nation to define the baseline or edge of its coastline, where it is deeply indented or is fringed with islands as a series of points that enclose the landmasses and surrounding waters. It cannot be used to cut off the territorial sea of another state from its exclusive economic zone or the high seas.
Internal Waters – All waters landward of the baseline, this includes those waters landward of a straight baseline. The coastal nation has jurisdiction over all internal waters to include law enforcement, environmental regulation and maritime regulation. The right of innocent passage does exist for passage through internal waters contained within a straight baseline.
"United Nations Convention on the Law of the Sea," 10 December 1982, Articles 7 and 8.

[21] U.S. Department of State, *United States Response to Excessive Maritime Claims, Limits in the Seas, No. 112,* (Washington D.C.: Office of Ocean Affairs, 1992), 29-30, 73-74, http://www.state.gov/documents/organization/58381.pdf (accessed 20 October 2007).

begun a program to build six new ice breaking patrol boats and will station them at a refurbished base in the Arctic Islands, while also establishing an Army base on another of the islands.[22] Finally, to allow the Canadian military to monitor unannounced traffic flowing both on and below the surface of the Northwest Passage, the Canadians are set to install acoustic monitoring arrays in the passage starting in the summer of 2008.[23]

The competing maritime claims in the Arctic are a source of growing conflict as the ice retreats and activity in the region heats up. However, it is one that should be relegated to the negotiating table provided all parties involved have a seat. Although the United States has abided by UNCLOS since the Reagan Administration and signed the treaty in 1994, it has not ratified the treaty. The United States remains the only Arctic nation not to have ratified the treaty. Conservative politicians have long stalled action on the treaty in the Senate out of concerns that it infringes on United States sovereignty and national interests.[24] As a result, in the words of a recent British editorial, "Uncle Sam is still shivering at the waters edge," without a seat at the table to influence resolution of conflicting claims and to stake its own maritime claim in the Arctic.[25]

Factors affecting United States policy and operations in the Arctic go well beyond legal arguments, claims and counter-claims. Environmental considerations will effect any operation in the Arctic whether it is commercial or military. As the climate warms and the

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[22] Richard Gwyn, "Canada Must Lead by Example in Claiming Arctic," *The Toronto Star*, 4 September 2007, http://www.opensource.gov (accessed 25 September 2007).
[23] "Canada to Monitor Water Traffic in Northwest Passage," *CBC News*, 24 September 2007, http://www.cbc.ca/canada/story/2007/09/24/technology-passage.html#skip300x250 (accessed 21 October 2007).
[24] "Law Of Sea Treaty On Senate Fast-Track: Bush Administration Pushing For Ratification In Next 3 Weeks," World Net Daily, 30 September 2007, http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=57903 (accessed 2 October 2007).
[25] Editorial, "Why Uncle Sam is still shivering at the water's edge; The Bush administration has revived a request to ratify the United Nations Convention on the Law of the Sea**,** dredging up ghosts of decades past and a fight for control of the high seas," *Lloyd's List*, 12 October 2007, http://www.lexisnexis.com (accessed 20 October 2007).

ice retreats, the permafrost that makes up much of the Arctic coastline will melt, resulting effectively in liquefaction of the coastlines during the summer months. This will become problematic when it comes to building roads and shore infrastructure necessary for long-term Arctic operations. With greater commercial activity, particularly from oil exploration and extraction and commercial ship traffic across the Arctic, the likelihood of oil spills will grow considerably. Due to its remote location, cold temperatures and delicate ecosystem, mitigating the risk of oil contamination in the Arctic is, or should be, a major concern for the five Arctic nations.[26]

The United States must also consider operational factors to effectively operate in the Arctic region on a permanent or at least seasonal basis in the coming years. The first of these is what roles and missions does the United States have in the region? The second is what type of command and control structure should exist? Unique challenges of force structure and logistics makes up the third factor that must be considered.

Roles and missions for the United States in the Arctic region equate to operational objectives. The objectives for the United States in the region are mostly traditional ones, albeit with some unique challenges. As the Arctic becomes an increasingly busy thoroughfare for commercial traffic, the requirement will also emerge for the United States to ensure access to this new region. Thus, broadly speaking, objectives would include maritime presence and security, law enforcement, search and rescue and environmental response. How the United States breaks down and assigns these roles and missions will drive how it resolves other operational factors it must consider.[27]

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[26] Jessie C. Carman, "Economic and Strategic Implications of Ice-Free Arctic Seas," 178-179.
[27] Office of Naval Research, Naval Ice Center, Oceanographer of the Navy and the Arctic Research Commission, *Naval Operations in an Ice-free Arctic.* (Washington, D.C.: April 2001), 34.

As matters presently stand, command and control in the Arctic region is a pie-shaped arrangement of three intersecting combatant commands, United States Northern Command (USNORTHCOM), United States Pacific Command (USPACOM) and United States European Command (USEUCOM). Their areas of responsibility in the Arctic are of geographic convenience as they all intersect at the North Pole (see figure 5).[28]

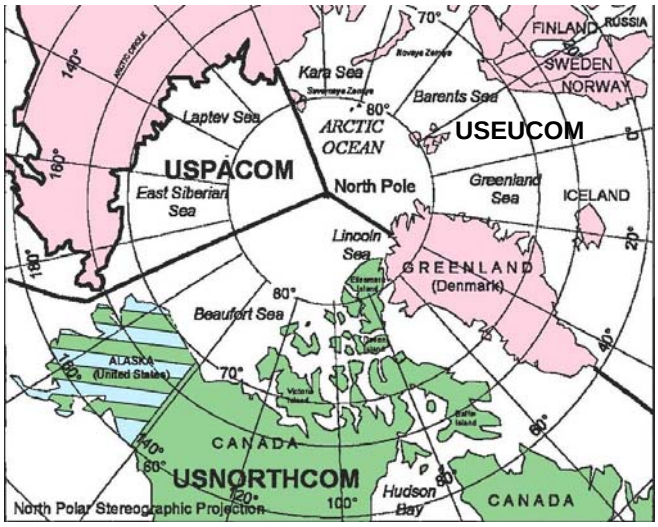

Figure 5 - Adapted from www.defencelink.mil

This arrangement is ill-suited for the region as it becomes an active theater of operations where literally United States forces can pass through all three combatant commands during one 360^{o} turn around the North Pole. Nor does the present arrangement take advantage of the United States Coast Guard, which has both equipment and experience operating in the Arctic, but does not currently have a national defense mission in the region.[29] The United States must look into the future and address whether this current organization will address needs for unity of command or unity of effort in the Arctic against a variety of potential challenges and threats.[30]

Force structure and logistics in the Arctic pose unique challenges if the United States wants to be able to deploy a force, with the right mix of capabilities, to operate in the area during different times of the year, during difficult weather conditions and in limited space. Challenges to Arctic operations cover all dimensions of force structure and logistics including:

[28] Unified Command Plan, map, http://www.defenselink.mil, (accessed 25 September 2007).
[29] National Research Council, *Polar Icebreakers in a Changing World: An Assessment of U.S. Needs*, (Washington, D.C.: The National Academy Press, 2007), 48-49.
[30] Ibid., 33.

- Space: Current satellite communication and overhead surveillance assets are limited in the Arctic region.

- Aviation: The harsh Arctic conditions will challenge the ability to operate aircraft in the region for logistics, patrol, anti-submarine warfare etc.

- Surface ships: Operations in the Arctic will require reinforced hulls, propellers and sonar against ice and will expose limitations in the United States' existing ice breaking capability (only three Coast Guard Arctic ice breakers are in active service).

- Weapons Systems: Testing of weapons system performance for all platforms in the Arctic is limited or non-existent.

- Inter-agency: The Arctic remains a largely uncharted region that will require extensive surveying to develop adequate nautical charts and laying navigation markers.

- Basing and logistics: The Arctic is a remote region of the world, thousands of miles from an existing base. Sustained operations in the region will require bases in the far north and a logistics infrastructure that does not currently exist. [31, 32]

Fundamentally, operations in the Arctic require unique assets to be successful. These can not necessarily be taken out of the United States' existing inventory of force capabilities. It will require an investment of time and resources to design, build and deploy the required capabilities.

The remainder of the discussion in this paper will focus on the two factors that will have an over arching impact on the United State's future presence in the Arctic. The first is UNCLOS while the second is command and control for the Arctic.

Analysis and Recommendations – Proposed Solutions

> I urge the Senate to act favorably on U.S. accession to the United Nations Convention on the Law of the Sea during this session of Congress. Joining will serve the national security interests of the United States, including the maritime mobility of our armed forces worldwide. It will secure U.S.

[31] Matthew L. Ward and Andrew C. Revkin, "Coast Guard Plans its first Operating Base in Arctic's Warming Seas as Shipping Increases," *New York Times News Service*, run in *The New London Day*, 19 October 2007, sec A3.
[32] Office of Naval Research, *Naval Operations in an Ice-free Arctic*, 12-42.

> sovereign rights over extensive marine areas, including the valuable natural resources they contain.
>
> *President G.W. Bush, 15 May 2007*

The United States' interest in UNCLOS is about having a seat at the table. The implications of this strategic issue reach down to the operational level. The impact will affect the operational functions of movement and maneuver which in turn affect the factors of time and space. UNCLOS is strongly supported by the Chief of Naval Operations (CNO) and the Commandant of the Coast Guard. In testimony before the Senate Armed Services committee in 2004, then CNO, Admiral Vern Clark made the following points regarding UNCLOS:

- Ensures the right of warships to transit international straits and archipelagic waters.
- Maintains a nations right to conduct military operations in the exclusive economic zone of another country without prior permission or notification.
- Ensures the Navy's freedom of navigation and thus its operational maneuver space.
- Ratifying the treaty ensures the United States has a seat at the table to negotiate, specifically to influence the resolution of maritime claims and preserve United States interests.[33]

Finally, he assured the committee that UNCLOS provides the military the backing of law and that he would not recommend the treaty if it required the United States to get a "permission slip" to conduct operations.[34]

Admiral Thad Allen, the Commandant of the Coast Guard, expanding on the President's statement, urged ratification of UNCLOS. He stated that joining the treaty enhances the Coast Guard's ability to protect American citizens as well as fisheries and marine resources. Furthermore he stated that UNCLOS would ensure the United States'

[33] Walter T. Ham, "CNO Supports Ratification of the Law of the Sea Treaty," *Navy Newsstand*, 9 April 2004, http://www.news.navy.mil (accessed 28 September 2007).
[34] Ibid.

military and specifically the Coast Guard's ability to carry out maritime security and law enforcement. Admiral Allen stated that UNCLOS is an appropriate balance between international regulation and individual national sovereignty.[35]

Opponents of the UNCLOS highlight their opposition by referring to it as the Law of the Sea Treaty or "LOST" for short. They base their opposition to the treaty on concerns for United States sovereignty and deep sea mining rights. The conservative think tank, the Heritage Foundation states that "bureaucracies established by multilateral treaties often lack the transparency and accountability necessary to ensure that they are untainted by corruption, mismanagement or inappropriate claims of authority. The LOST bureaucracy is called the International Seabed Authority Secretariat, which has a strong incentive to enhance its own authority at the expense of state sovereignty."[36] Sen. Jim DeMint, R-S.C., expressed particular concern that UNCLOS does not adequately address unique commercial and military concerns of the United States as the world's only superpower. Furthermore opponents are concerned that the treaty would impose additional taxes on American companies seeking to tap into marine energy resources and that provisions in the treaty regarding how ocean pollution is defined would provide environmentalists an alternate means to implement greenhouse gas reduction without the consent of the American people. Finally, opponents to UNCLOS are concerned that United States' will not have an adequate voice in the treaty since the United States would have one vote out of 140 and no veto power as it does on the United Nations Security council.[37]

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[35] "Adm. Thad Allen, Commandant of Coast Guard, on Convention on the Law of Sea," *US Fed News*, 17 May 2007, http://www.lexisnexis.com (accessed 28 September 2007).
[36] "Law Of Sea Treaty On Senate Fast-Track Bush Administration Pushing For Ratification In Next 3 Weeks," *WorldNetDaily.com*.
[37] Ibid.

To quote William Shakespeare, "To be or not to be, that is the question," facing the United States regarding its decision whether or not to ratify UNCLOS. The United States can either make a stand on principle out of concern for national sovereignty, remaining above the fray or it can ratify the treaty and become bound by its provisions. In the Arctic, failure to ratify UNCLOS would result in Russia becoming the dominant power in the region, pushing its claim of sovereignty over nearly half the Arctic basin. It would also leave the United States in an awkward position in trying to resolve its long standing dispute with Canada, a vital alley, over the transit regime through the Northwest Passage. This in turn could have a direct impact on the United State's ability to move forces in a timely fashion in response to a crisis. In the final analysis the United States must ratify UNCLOS and gain a seat at the table.

The second issue to address is the type of command and control structure required for the United States to operate in the Arctic, both now and in the future. As the Arctic opens to more and more commercial ventures and the race to claim resources heats up, the region will be prone to contest and conflict. In this new maritime commons, the present command and control structure is not ideally suited to conduct operations in the region. What is more, there are no on-going discussions at the Joint Staff to address operations in the Arctic and the nature of the command structure necessary to support such operations.[38]

In the best case, operations in the Arctic will always be a challenge due to the harsh environment, distance from logistics bases and limited assets that can effectively operate there, even during optimal weather. This challenge will not be unique to the United States, but will also affect traditional allies such as Canada, Norway and Denmark. The present command structure limits the ability of the United States and its allies to develop and sustain

[38] CDR Michael Feyedelem (Joint Chiefs of Staff, J5 Directorate) telephone call with author, 9 October 2007.

unity of effort in the Arctic region to ensure access, environmental protection and security across areas of interest common to all four countries. Specific military concerns include providing a credible deterrent against Russia's expansion into the region, in light of their Arctic maritime claims and renewed Cold War style bomber patrols, which includes sorties and cruise missile launches over the Arctic.[39]

Studies to address potential operations in the Arctic have focused on many of the technical and force structure challenges facing the United States. However, those studies did not discuss in any detail the nature of command and control arrangements the United States and allied forces might require in the Arctic. What is more, these studies were conducted five and six years ago when the timeline for the retreat of the Arctic sea ice was thought to be years away, and an ice free Arctic still decades away. Furthermore, these studies were conducted when the United States had more latitude to explore new areas of operations. Now, operations in Iraq and Afghanistan are focusing United States efforts and resources on these regions as well as the need to reset forces and equipment returning from the Middle East.[40]

With the United States fully committed in the Middle East for the foreseeable future, other countries will focus on their strategic aims in the region and the United States will be left behind. Resources are limited for large scale development of a new command and control structure with supporting hardware, and even less available for the conduct of sustained operations in this new environment. However, the Arctic, with the prospect for energy resources and the opening of a major commercial thorough fair, will likely alter the global transport system in the coming years. Accordingly, the United States should not wait

[39] Michael Evans and Tony Halpin, "RAF Intercepts Eight Russian Bombers as Putin Provokes West," *The Times (London),* 7 September 2007, http://www.lexisnexis.com (accessed 28 October 2007).
[40] Joint Chiefs of Staff, "Chairman's Priorities," http://www.jcs.mil (accessed 28 October 2007).

for other countries to seize the initiative in the Arctic or wait for a regional crisis. Instead, the United States' approach to the Arctic should be in measured steps.

First, establish a Joint Inter-Agency Task Force (JIATF) for the Arctic region. This task force will serve to dissolve the lines between the three combatant commanders that cover the region and integrate the interests of the Department of Defense, Department of Homeland Security and other agencies who will have a role in the Arctic region. JIATF-Arctic tasks would include development of initial contingency plans for operations in the region as well as identification of logistics, resources and capabilities required to support operations.

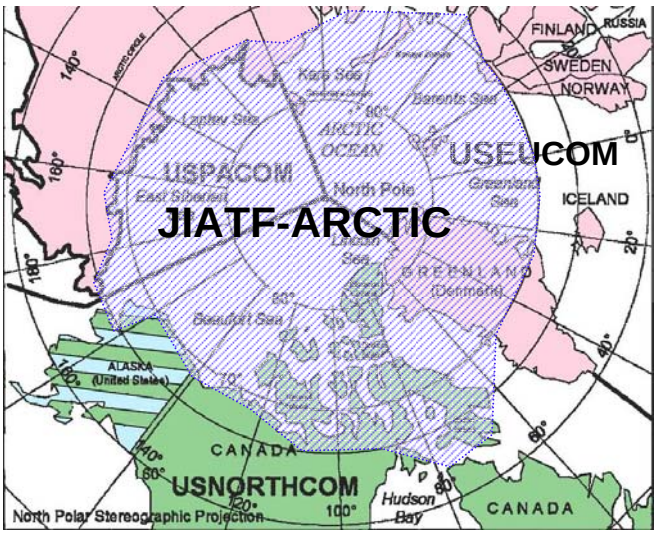

Figure 6 - Adapted from www.defencelink.mil

Its area of responsibility would include the Arctic Ocean and surrounding seas up to the coastline of the respective Arctic nations and include both the Northwest Passage and Northern Sea Route (see figure 6).[41] The assets and experience of the Coast Guard would be a critical aspect of this planning effort since they possess the United States' existing ice breaking capabilities which will remain a necessary component of any operation in the region for years to come.

Second, JIATF-Arctic, with EUCOM as the lead combatant command, should begin working with traditional United States allies and North Atlantic Treaty Organization (NATO) members, Canada, Norway and Denmark to establish protocols and procedures for a NATO Arctic patrol. In the near term, this would rely heavily on the existing ice breaking and coast guard capabilities of the four nations operating in this area.

[41] Unified Command Plan, map, http://www.defenselink.mil

The third step in the United States' approach to the Arctic is likely a decade or more in the future. This will depend on how the various maritime claims are resolved under UNCLOS, how the prospects for energy resources develop and what posture Russia takes in the Arctic and the world. Assuming that maritime commerce between the Atlantic and Pacific is flowing across the Arctic during the summer months, and oil and natural gas resources are being exploited, a sustained presence will be required to ensure security and access to the region. JIATF-Arctic would require forces appropriately equipped to operate in the region with additional command and control resources in place to support communications, navigation and overhead surveillance. Establishing a standing NATO naval force in the Arctic similar to NATO's standing force in the Mediterranean would serve to provide security in the region while sharing the burden between NATO nations.

Finally, as a fourth step, consideration should be given to redefining the Unified Command Plan such that one combatant command has cognizance over the entire region. If Russia assumes an aggressive posture, USEUCOM becomes a logical choice to ensure unity of command in any effort to counter and deter Russia. If overall security is of paramount concern in the Arctic region, then USNORTHCOM is a logical choice due to its alignment with Canada and the Northwest Passage.

Conclusion

The Arctic is changing, driven by the forces of global climate change. A new maritime commons is opening with the melting of the ice. Additionally, retreat of Arctic ice is lifting the lid on a potentially vast storehouse of oil and natural gas that could reduce the dominance of the Middle East in the world energy market. New commercial shipping routes

through the Arctic will take not just days, but weeks off of the time required to ship goods and petroleum products from east to west and vice versa.

Many challenges present themselves with the opening of the Arctic. Conflicts may arise as the Arctic nations of Russian, Canada, Norway, Denmark and the United States seek to claim maritime resources beyond 200 nautical miles. The constrained geography of the Arctic only heightens the potential for tension. Resolution of these disputes will test the provisions of UNCLOS and the United States must be party to the treaty to ensure its interests are preserved and the rights of the other Arctic nations are not overshadowed by Russia.

Command and control in the Arctic is equally challenging. The remote location and harsh environment will require advance planning to ensure that a flexible, inter-agency organization is established that can direct operations seamlessly across the boundaries of the present three combatant commands. In the foreseeable future, this command structure should take the form of a JIATF that can coordinate the military, Coast Guard, and inter-agency organizations that will have a role in the Arctic. The Arctic joint task force will also serve as the United States' component of NATO forces in the region.

As a maritime nation, the United States can not ignore new maritime domains and the opportunities for commerce and resources they bring. The impact climate change is having on the world and in the Arctic specifically, must be recognized. To remain a leader in the world, and ensure the security of global commerce and energy supplies, the United States must adapt to a changing world and engage in the Arctic maritime commons.

Appendix

The retreat of the ice in the Arctic and its opening as a new maritime commons is being driven by a global phenomenon known as climate change. Discussion of climate change and greenhouse gases is an expansive topic in and of itself. However, to provide the reader a window into the larger mechanisms at work, it will be touched on here because it is useful in understanding the forces now at work in the Arctic Ocean.

Climate change is a part of the earth's natural cycle, a fact often lost in today's political debate. The earth's climate cools and warms within a cycle of glacial periods, commonly known as ice ages and inter-glacial periods which are best described as periods of warming between the ice ages. Ice core samples from the Greenland ice sheet, collected during the 1990s and extending two miles into the ice, provide scientists with a window into the earth's climate past, extending back between 250,000 and 400,000 years. This data, supported by core samples taken in other parts of the globe, indicate that the earth has experience four glacial periods in the last 400,000 years, each lasting between roughly 70,000 and 100,000 years and four previous inter-glacial periods lasting on average 18,000 years.[42] The current inter-glacial period, known as the Holocene Period, began approximately 18,000 years ago; to date, it is characterized by a relatively benign climate and represents the only epoch human civilization has known.[43, 44]

Natural and man made factors affect the earth's climate today, both involve the accumulation of greenhouse gases in the atmosphere as the primary driver of climate change.

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[42] Neither glacial nor inter-glacial periods are uniformly cold or warm respectively. The evidence indicates that both periods have experienced dramatic climate shifts that brought periods of warmth to ice ages and a comparative deep freeze to an otherwise warm period. These variations in temperature have lasted anywhere from a few hundred years to a few thousand years.

[43] Harm J. De Blij *Why Geography Matters: Three Challenges Facing America: Climate Change, the Rise of China and Global Terrorism* (New York, NY: Oxford University Press, 2005), 65-73, 82-83.

[44] Eugene Linden. *The Winds of Change: Climate, Weather and the Destruction of Civilizations*, (New York, NY: Simon & Schuster, 2006), 129-135.

Greenhouse gases, as defined by NASA's Earth Observatory, are a component of the earth's atmosphere that allows the suns radiation to penetrate the atmosphere and reach the surface of the earth. A portion of the reflected radiation is traped so it cannot escape, heating the atmosphere near the earth's surface. Greenhouse gases include carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and water vapor. Carbon dioxide, methane and nitrous oxide have both natural and human sources, while chlorofluorocarbons' are strictly manmade.[45]

Between the doomsday prophets and ardent nay-sayers is a growing body of facts that are shedding light on man's contribution to climate change. Since the onset of the industrial revolution, man has increased the concentration of greenhouse gasses in the atmosphere by more than 150 percent. Greenhouse gas concentrations continue to increase, and are on track to double from their pre-industrial levels within the next thirty years.[46] Since 1900, the earth has warmed 0.7^{o}C. The most rapid warming occurred during the last thirty years, when the global mean temperature rose roughly 0.2^{o}C per decade.[47] This has created an "energy imbalance" as more of the sun's energy is absorbed by the earth than is reflected back into space. Thus accelerating the pace of climate change beyond what scientists believe would occur due to the Holocene Period alone.[48] To put this into perspective, the temperature difference between the present warm period and the last ice age is only about 5 ½^{o}C.[49]

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[45] NASA Earth Observatory, "Glossary," NASA Earth Observatory, http://eobglossary.gsfc.nasa.gov/Library/glossary.php3 (accessed 13 October 2007).
[46] Sir Nicholas Stern. *The Stern Review: The Economics of Climate Change*, (London: Cambridge University Press, 2006), 169, http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change (accessed 13 October 2007).
[47] Ibid, 5.
[48] Rani Chohan, "Scientists Confirm Earth's Energy Is Out Of Balance," NASA Earth Observatory, April 29, 2005, http://www.nasa.gov/vision/earth/environment/earth_energy.html (accessed 13 October 2007).
[49] John D. Cox. *Climate Crash: Abrupt Climate Change and What it Means for Our Future*, (Washington, D.C.: Joseph Henry Press, 2005), 65.

As a result, the Intergovernmental Panel on Climate Change (IPCC), a United Nations (UN) organization, in their fourth assessment report, released in 2007 described man's contribution to climate change as "unequivocal."[50] Mr. Rajendra Pachauri, Chairman of the IPCC in his recent address to the opening session of the United Nations General Assembly noted that as a result of human activity, carbon dioxide concentrations in the atmosphere have risen beyond anything seen in the past 650,000 years. He went on to observe that the pace of climate change is accelerating, with the 11 hottest years in recorded history occurring in the past 12 years.[51]

How fast and far temperatures might rise and is a question of critical importance. Based on the greenhouse gases emitted into the atmosphere by man, researchers indicate that the earth is committed to a rise in the mean temperature of 2-5^{o}C in the next fifty years. If greenhouse gas emissions continue unabated, the potential is for temperatures to rise above 5^{o}C by the end of the century. Science has largely settled on this as the baseline scenario, In the Arctic, as noted by Mr. Rajendra Pachauri, the rate of temperature rise during the last century was twice the global average, and is likely to rise another 8^{o}C by the middle of the century.[52, 53]

There are variables in the climate system, that are not fully understood, which could have a dramatic affect the world's climate. The effect of greenhouse gasses on the earth's climate could be enhanced due to feedback factors including increased evaporation of oceans, particularly in the tropics, which will increase the amount of water vapor in the

[50] Gateway to the UN's Systems Work on Climate Change, http://www.un.org/climatechange/index.shtml (accessed 13 October 2007).
[51] Rajendra Pachauri, Chairman of the IPCC (address, United Nations General Assembly, 24 September 2007), http://www.ipcc.ch/Pachauri_240907.pdf (accessed 13 October 2007).
[52] Ibid.
[53] Garrett W. Brass, Ed., *Arctic Ocean and Climate Change: A Scenario for the U.S. Navy*, Special Publication No. 02-1, (Arlington, VA: US Arctic Research Commission, 2002), 8.

atmosphere (the most potent greenhouse gas) and the release of entrapped methane and carbon dioxide in the ice caps and permafrost of the far northern latitudes. Estimates indicate there might be enough greenhouse gasses trapped in the permafrost alone to double the concentration in the earth's atmosphere caused by fossil fuels alone. This has the potential for causing an additional 1-2^{o}C rise in the earth's mean temperature above and beyond the temperature rise currently considered the baseline.[54]

The most dramatic scenario for the earth's climate could lead to a climate collapse. It involves the complex interaction that involves many factors including melting of the polar ice caps and the resulting dilution of sea water density in the Norwegian/Greenland Sea. The interaction of the dense water in the Norwegian/Greenland Sea with the less dense waters of the North Atlantic is theorized to provide the driving head for the Thermalhaline Circulation (THC), a global ocean current conveyor, which is thought to play a pivotal role in regulating the earth's climate system. Disruption of the THC, due to losing the driving head, may lead the earth's climate across a tipping point resulting in the onset of the next glacial period or some lesser abrupt climate change scenario.[55]

The retreat of the Arctic sea ice is one piece of a changing climate system. A geopolitical contest for access to maritime resources could result due to the clearly observable retreat of the Arctic sea ice. Effectively the first tangible result of climate change, the Arctic may forebode much more significant changes the world will experience in the decades to come.

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[54] Eugene Linden. *The Winds of Change: Climate, Weather and the Destruction of Civilizations*, 249-250. Sir Nicholas Stern. *The Stern Review: The Economics of Climate Change*, 1-12.
[55] Peter Schwartz and Doug Randall. *An Abrupt Climate Change Scenario and Its Implications for United States National Security*, (Washington D.C.: Office of Net Assessment, Office of the Secretary of Defense, October 2003), 4-10.

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